

Contents lists available at [ScienceDirect](https://www.sciencedirect.com)

International Journal of Africa Nursing Sciences

journal homepage: www.elsevier.com/locate/ijans

Perceptions of mothers who experienced early skin-to-skin contact after repeat cesarean section in Tanzania: Pilot implementation

Yumiko Igarashi^a, Rika Fukutomi^{a,*}, Beatrice Mwilike^b, Shigeko Horiuchi^a

^a St. Luke's International University, 10-1 Akashi-cho, Tokyo 104-0044, Japan

^b Muhimbili University of Health and Allied Sciences, School of Nursing, P. O. Box 65004, Dares Salaam, Tanzania

ARTICLE INFO

Keywords:

Tanzania
Cesarean section
Cesarean birth
Skin-to-skin contact
Skin-to-skin care

ABSTRACT

Background and Objectives: The rate of cesarean section (CS) at Muhimbili National Hospital (MNH) in Dar es Salaam, Tanzania, is currently higher than 50%. Mothers and infants are typically separated immediately after CS. The aims of this study were to develop and implement an *early skin-to-skin contact (SSC) after CS* protocol and to describe the mothers' perceptions of *early SSC after CS*.

Design: An action research design with a questionnaire survey was used.

Setting: MNH located in Dar es Salaam, Tanzania.

Patients: Pregnant women who underwent elective repeat CS from August 2018 to the end of September 2018.

Intervention: A two-step educational program, which consisted of a *training program for the medical staff* and an *information program for the pregnant women*, and *early SSC after CS* were implemented. Interviews were conducted to examine the participants' perceptions of SSC after CS.

Results: A total of 26 pregnant women were recruited, of whom 17 (65%) participated. All 17 mothers answered *very satisfied* or *satisfied* of the *early SSC after CS* using a 5-point scale. The *information program for the pregnant women* was scored on a 10-point scale (0 = *completely useless*; 10 = *very useful*). There were 15 mothers (88%) who scored the program 10 points, and the remaining two mothers (12%) eight points. Some mothers wanted extended times and places of *early SSC after CS*.

Conclusions: The developed *early SSC after CS* protocol facilitated understanding of the perceptions of SSC after CS and may be a promising program for implementing *early SSC after CS*.

1. Introduction

The World Health Organization (WHO) has advocated that a cesarean section (CS) must be performed when the maternal and infant conditions require CS for medical reasons (WHO, 2015). Although CS rates higher than 10% are not associated with reductions in maternal and newborn mortality rates at the population level (WHO, 2015), the CS rates have remained high in some settings. In Tanzania, the population-based CS rate increased from 2% in 1996 to 6% in 2015–2016. The CS rate remained higher among women living in urban areas than among women living in rural areas, with the gap widening over time (Cavallaro et al., 2018). In Dar es Salaam, which is the largest city of Tanzania, the CS rate was 17% in 2015–2016 (Ministry of Health, Community Development, Gender, Elderly and Children (MoHCDGEC) [Tanzania Mainland], Ministry of Health (MoH) [Zanzibar], National Bureau of Statistics (NBS), Office of the Chief Government Statistician

(OCGS), and ICF, (2016)).

In the most recent demographic health survey, Cavallaro et al. (2018) reported that majority of facility deliveries occurred in the public sector, and that two-thirds of all CSs were conducted in public facilities in 2015–2016. According to the 2017 annual report of Muhimbili National Hospital (MNH), which is the largest national hospital in Dar es Salaam, the hospital's CS rate was 65.3%. The annual report also showed that the number of deliveries was 9,104 births. Specifically, the obstetric theater logged in 5,946 CS births per year with an average of 495 CS births per month.

MNH is the largest hospital in the country and is responsible for accepting referrals from surrounding areas. This likely accounts for the high CS rate which needs to be looked at more carefully in future studies. The main reasons for transportation were the worsening of complications such as pre-eclampsia, and the inability to perform CS owing to shortages of staff and equipment. Infants born by CS were typically

* Corresponding author.

E-mail address: 19dn002@slcn.ac.jp (Y. Igarashi).

<https://doi.org/10.1016/j.ijans.2021.100337>

Received 24 June 2020; Received in revised form 30 June 2021; Accepted 17 July 2021

Available online 22 July 2021

2214-1391/© 2021 Published by Elsevier Ltd. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

separated from their mothers immediately after CS, whereas infants born by vaginal delivery were not separated and can stay together with their mothers. In the case of vaginal delivery, early SSC may be performed if the conditions of the baby and mother were stable. Mothers and infants were typically separated for 24–48 hours after CS, although this depends on the infant's condition. The WHO has recommended that newborns without complications should be kept in skin-to-skin contact (SSC) with their mothers during the first hour after birth to prevent hypothermia and promote breastfeeding (WHO, 2018). With the many benefits afforded by early SSC, it may be required to be performed on as many newborns as possible, regardless of the delivery mode.

Notably, current observations at the MNH obstetric theater indicated that mothers were not encouraged by midwives to practice *early SSC after CS*. Also, information about early SSC was not provided by midwives in the MNH antenatal clinic during the health education session. When mothers who underwent CS at the MNH obstetric theater were asked whether they wanted to receive early SSC or not, a few mothers refused because they were still experiencing pain and tiredness from giving birth. They did not have sufficient time to understand the benefits of *early SSC after CS*. Failure on the part of the mothers to understand the importance of *early SSC after CS* would likely make them refuse it and consequently forfeit its benefits. According to a study that revealed the coping approach and understanding of labor of Tanzanian women, guidance in the delivery room, routine care, and staff introduction should be provided to women during pregnancy to promote a sense of security (Fujita et al., 2017). Therefore, educating mothers in advance is crucial, and assessing what information would be timely and meaningful is important. In this context, the development of a protocol that clearly describes the procedure of *early SSC after CS* and provides vital information for the implementation of education for both the staff and the mothers is necessary.

SSC has a positive effect on breastfeeding 1–4 months after giving birth and on the exclusivity of breastfeeding 4–6 months after giving birth. As exclusive breastfeeding is associated with improved survival, SSC may be expected to reduce neonatal mortality (WHO, 2012). However, the practice of early SSC is not yet a reality in Tanzania. An observational study on six indicators of the quality of newborn care immediately after birth in six sub-Saharan African countries (including Tanzania) was previously conducted by de Graft-Johnson et al. (2017). They reported that only 43% of mothers were provided assistance to initiate breastfeeding within the newborns' first hour of life. Specifically, they found that only 45% of newborns in Tanzania were provided SSC immediately after delivery.

The benefits of *early SSC after CS* have been documented in numerous studies. *Early SSC after CS* made mothers feel closer to their newborn (Hung & Berg, 2011). Mothers also indicated how they enjoyed having SSC with their baby in the operation theater, which was much better than when they had their last baby (Brady, Bulpitt, & Chiarelli, 2014). Women practicing *early SSC after CS* were more likely to breastfeed up to 4 months after birth (Moore et al., 2016); administration of additional pain medication during CS was less among women who experienced early SSC than those who did not (Sundin & Mazac, 2015). In addition, a study suggested that *early SSC after CS* was not associated with disadvantages during the neonatal transition (Kollmann et al., 2017). However, infants born by CS had a significantly increased risk of lower Apgar scores, respiratory problems, and hypothermia (Karlstrom et al., 2013). These risks can occur regardless of SSC implementation. Therefore, it was recommended that all mothers who engaged in SSC should be provided with specific instructions to observe their newborns' condition (e.g., difficulty in breathing) and to notify the medical staff if they observe any changes (Karlstrom et al., 2013).

On the other hand, there are also various hurdles in the implementation of SSC. A previous study has identified critical institutional factors which included inadequate staffing and education of clinicians on early SSC (Koopman et al., 2016). Another study has identified fear of change and initial reluctance to change by the staff, which eventually

improved towards a more positive behavior after education (Hung & Berg, 2011). Therefore, staff education is important. Implementation is not simply an event. It is a mission-oriented process involving multiple decisions, actions, and corrections designed to make full use of effective innovations in educational settings (National Implementation Research Network, 2020). Therefore, the implementation of *early SSC after CS* must be carried out step by step, that is, there must be an initial implementation stage before moving to the full implementation stage.

Given the high CS rate at MNH, improvements in maternal and neonatal care during CS, such as implementation of *early SSC after CS*, are crucial for promoting the health of mothers and their babies. A two-step educational program could reduce the fear of change among the staff and facilitate early SSC. In addition, mothers would have an informed choice, and they can participate at their own discretion after understanding the benefits of and considerations for early SSC.

The aims of this study were to develop and implement an *early SSC after CS* protocol using a two-step educational program, and to describe the mothers' perceptions of the *early SSC after CS*.

2. Methods

2.1. Study design

An action research study design was used. Action research is an approach to scholarly inquiry in which the researcher and a client collaborate in the diagnosis of the problem and in the development of a solution based on the diagnosis (Bryman & Bell, 2011). In the present study, the researchers collaborated with midwives who worked at the antenatal clinic and obstetric theater of MNH for the improvement of maternity care by promoting *early SSC after CS*. Casey et al. previously reported that the use of an *implementation science framework* within an action research approach can reduce the research practice time lag (Casey, O'Leary & Coghlan, 2018). In the present study, *pilot implementation* was conducted as the initial stage of implementation. Qualitative and quantitative data were obtained using semistructured interviews and questionnaires from August 2018 to September 2018.

2.2. Study setting

The study setting was at MNH in Dar es Salaam, Tanzania. Dar es Salaam is the largest city in Tanzania and the country's center for commerce. In 2016–2017, its population was 5,781,557 (Global Partnership for Sustainable Development Data, 2016), which was approximately 11% of the national population. Slightly over half of the female population was of childbearing age (Leyna et al., 2017).

According to the 2017 annual report of MNH, the annual number of deliveries was about 9,104, and the obstetric theater logged in 5,946 CS births. The hospital's CS rate was 65.3%. The reason for the high CS rate might be that surrounding hospitals were not able to perform CS owing to the lack of personnel and equipment. Non-high-risk pregnant women routinely received spinal anesthesia during CS. The antenatal clinic staff cares for 100–150 pregnant women per day.

2.3. Study population

The unit of analysis was pregnant women scheduled for elective repeat CS at MNH. This study population enables a comparison of the past experience of no *early SSC after CS* with the present experience of *early SSC after CS*. The inclusion criteria were as follows: (a) women aged over 18 years, (b) gestation age over 32 weeks, (c) native speaker of Swahili, and (d) had one or more CS births. The exclusion criteria were high-risk pregnancy with the following conditions: (a) psychiatric disease, (b) severe anemia, (c) severe pregnancy-induced hypertension, (d) severe pre-eclampsia, and (e) emergency CS.

2.4. Intervention

2.4.1. Recruitment of SSC promotion team

An SSC promotion team was organized to assist in promoting *early SSC after CS*. The team consisted of one midwife from the antenatal clinic and five midwives from the obstetric theater who agreed to participate in this study. The SSC promotion team member who worked at the antenatal clinic recruited participants and conducted an information program on *early SSC after CS*. The SSC promotion team members who worked at the obstetric theater took part in the implementation of *early SSC after CS* for the participants.

2.4.2. Recruitment of participants

Pregnant women who were scheduled to undergo elective repeat CS at the antenatal clinic were recruited by purposive sampling. Members of the SSC promotion team informed eligible pregnant women regarding the procedure, benefits, and risks of the study. The team carefully explained the objectives, methods, and ethical considerations of the study using a consent form. After receiving and understanding the explanation, the participants signed the consent form. The team members also obtained the following demographic data from the participants' clinical records: (a) age, (b) parity, (c) educational level, and (d) complications of pregnancy. According to Moser and Korstjens (2018), a guiding principle in qualitative research is to sample only until data saturation has been achieved. For content analysis, they reported that the estimated sample size is 15–20 interviews or three to four focus group discussions. The estimated minimum sample size was 15 pregnant women. A total of 26 pregnant women were initially recruited. Two women decided not to participate because of their family's opposition, four women were excluded because of emergency CS, and three women were unable to experience *early SSC after CS* owing to their babies' poor respiratory conditions. Therefore, 17 pregnant women (65%) participated in this study.

2.4.3. Education 1: Training program for medical staff

The researcher (YI) who is a midwife and who has participated in early essential newborn care seminars including SSC conducted a 30-minute training program on *early SSC after CS* for obstetricians, staff of the anesthesiology department, and midwives from the obstetric theater. The training program expounded on the definition, significance, benefits, and evidence of *early SSC after CS* (Table 1). It also focused on observation points to check if there was any deviation from normal for mothers (e.g., consciousness), infants (e.g., hypothermia, dyspnea, and cyanosis), and infant resuscitation before initiating *early SSC after CS*.

Table 1

Early skin-to-skin contact (SSC) after cesarean section (CS) protocol consisting of a two-step educational program (as shown below) and the implementation of *early SSC after CS*.

Education 1: Training program for medical staff	
Method	Lecture
Place	Conference room of operation theater
Material	Power point slide
Time	30 min
Contents	Definition, significance, benefit and evidence of <i>early SSC after CS</i> Procedure of <i>early SSC after CS</i> Observation points of mother and baby during <i>early SSC after CS</i> Neonatal resuscitation
Education 2: Information program for participants.	
Method	Lecture
Place	Antenatal clinic
Material	Ruminated leaflet
Time	20 min
Contents	Definition, significance, benefit and evidence of <i>early SSC after CS</i> Procedure of <i>early SSC after CS</i> How to observe mother and baby during <i>early SSC after CS</i>

The program adherence criteria were set following the above observation points.

2.4.4. Education 2: Information program for pregnant women (mothers scheduled for repeat CS)

The SSC promotion team member who worked at the antenatal clinic conducted an information program for consenting pregnant women. The program included the definition, significance, benefits, evidence, and procedure of *early SSC after CS* (Table 1). Through discussion, the SSC promotion team members decided on the contents of the information program in detail and prepared a visual aid educational material. The ruminated leaflet was made as an education material. It contained the definition, recommendations, benefits and procedure of *early SSC after CS* with pictures. After a pregnant woman received her perinatal check-up, the information program was implemented by providing verbal and visual instructions using it. The whole program was completed in approximately 20 min.

2.4.5. Implementation of *early SSC after repeat CS*

The SSC promotion team members who worked at the obstetric theater played a leadership role. They implemented the *early SSC after CS* for the pregnant women who consented to participate in this study. At the research facility, CS usually involves 2 anesthesiologists, 2 obstetricians, and 2 midwives. One midwife sterilizes and assists in surgery and another midwife takes care of the newborn and provides assistance. Prior to the implementation of *early SSC*, the midwife determined whether SSC was feasible and conducted resuscitation if necessary. The midwife took care of the infant and observed the infant according to the cancellation criteria for SSC after CS. If there were any deviations, the midwife stopped the implementation of SSC after CS. The midwife also prepared for emergency situations (e.g., unconsciousness in mothers and dyspnea or central cyanosis in infants) to provide rapid treatment. To maintain the quality of the implementation of *early SSC after CS*, lead researcher (YI) and research assistants observed the actual state of the implementation of *early SSC after CS* using the same checklist for all the participants. The checklist contained the following areas that had to be checked: compliance with the procedure of *early SSC after CS*, timing of the initiation of *early SSC after CS*, duration of *early SSC after CS*, reasons for stopping the SSC, and a description of the pregnant women's behaviors.

2.5. Data collection

Two research assistants who were native Swahili speakers with experience in conducting interviews were recruited to conduct interviews with the participants. The data collection period was from August 2018 to September 2018. They conducted semistructured interviews using an interview guide with the lead researcher (YI) in attendance to ensure fidelity of the process. In summary, the interview guide consisted of questions regarding feelings about the implementation of *early SSC after CS*, knowledge of *early SSC after CS*, usefulness of the *early SSC after CS* information program, differences between the information program and the implementation of *early SSC after CS*, comprehension of the *early SSC after CS* information program, perception of the advantages of *early SSC after CS*, and comparison of the satisfaction between the previous and present deliveries. These are explained more extensively below under 2.6 Measures. Mothers who received *early SSC after CS* were interviewed for approximately 20 min within 48 h after the completion of CS. The timing of the interviews was set in consideration of the discharge time from MNH of the mothers who underwent CS, which was commonly after three days. The research assistants conducted the interviews until all 17 mothers were completed.

2.6. Measures

The evaluation of the *early SSC after CS* protocol was based on the

mothers' perceptions of their SSC experience and the quality of the educational program. Bowen et al. (2009) have suggested 8 general areas of focus to determine the feasibility of program implementation. The present study focused on 3 areas: implementation, practicality, and acceptability. *Implementation* was evaluated according to the dropout rate and the underlying reason(s). *Practicality* was evaluated from observations of the actual state of implementation. *Acceptability* was evaluated by developing the following 7 indicators [(a) to (g)]:

(a) *Feelings about the implementation of early SSC after CS*. This indicator consisted of 6 open-ended questions related to the following items: ① difference between previous delivery and present delivery, ② feelings when the baby was placed on her chest, ③ feelings when touching her baby, ④ feelings of first breastfeeding, ⑤ anxiety during early SSC, and ⑥ request for a midwife during early SSC. This 6th item evaluated whether mothers requested help from midwives to hold their baby well. Mothers could talk freely about their feelings.

(b) *Knowledge of early SSC after CS*. This indicator was composed of 3 questions. Two of these were forced choice questions and 1 was an open-ended question. This indicator was created so that it can cover the full advantage points of knowledge of early SSC after CS and maintain study rigor by referring to prior reports in the literature.

(c) *Usefulness of the early SSC after CS information program*. This indicator was scored on a 10-point scale (0 = *Completely useless* to 10 = *Very useful*).

(d) *Differences between the information program and the implementation of early SSC after CS*. This indicator consisted of one 5-point scale question (1 = *Completely different* to 5 = *Completely the same*) and one open-ended question.

(e) *Comprehension of the early SSC after CS information program*. This indicator consisted of 12 questions. One question was not applicable because the short movie providing information on early SSC was not available owing to equipment failure. This content used a 5-point scale (1 = *Clearly heard* to 5 = *Completely did not hear*.)

(f) *Perception of the advantage points of early SSC after CS*. This indicator consisted of 9 questions using a 5-point scale (1 = *Totally agree* to 5 = *Totally disagree*). This indicator was created so that it can cover the full advantage points of perception of the advantage points of early SSC after CS and maintain study rigor by referring to prior reports in the literature.

(g) *Comparison of the satisfaction between the previous delivery and the present delivery*. This indicator was evaluated using a 5-point scale (1 = *Very dissatisfied* to 5 = *Very satisfied*). This indicator was created in a previous implementation study of CS in the operating theater (Sundin & Mazac, 2015).

2.7. Data analyses

Quantitative data were analyzed using basic non-parametric statistical analyses. Voice data from the IC recorder were transcribed and translated from Swahili to English by a Tanzanian nurse who has a doctorate (Ph.D.) in nursing science with a previous experience of translating interview data from Swahili to English. Qualitative data from observations and interviews were analyzed by content, and the category was clarified. The checking for qualitative validation was conducted as follows. The authors (YI and SH) comprehensively discussed the qualitative data. The credibility of the results was maintained by observing research reflexivity to provide an impartial analysis and checking of all the authors' attitude of attending systematically to the context of knowledge construction. Data triangulation was also carried out using several data sources such as transcripts and photos of the participants (Creswell & Clark, 2011).

2.8. Ethical considerations

This study adhered to the principles of voluntariness, anonymity, harmlessness, and protection of privacy and personal information.

Recruitment of participants was based on the principle of voluntariness. The invitation to participate could be refused using a refusal form. The participants could also decline to continue at any point in the study without being disadvantaged.

Data collection and management were based on the principles of anonymity, and protection of privacy and personal information. Data were used only for this study and kept in a locked location and in a computer, which was password-protected. All data were managed with serial numbers. The data and list of serial numbers to identify individuals were stored separately.

There were no governmental connections or religious conflicts of interest related to this study. Ethical clearance and permission were obtained from the Ethics Committee of St. Luke's International University (Approval number 18-A006) and the National Institute of Medical Research (NIMR/HQ/R.8a/Vol.IX/2574).

3. Results

3.1. Demographics of participants and duration of SSC

The mean age of the 17 participants was 31 years (SD 4.24; Range 21–39), with almost the same proportions in each age group (Table 2). The Tanzania 2015–16 Demographic and Health Survey and Malaria Indicator Survey (Ministry of Health, 2016) noted that only 23% of women in Tanzania have secondary or a higher level of education. These women have a higher level of education than the rest of the women nationwide.

There were 14 mothers (82%) who had experienced within 30 min early SSC after CS (Table 2). Cessation of SSC was initiated by some mothers (n = 12, 71%), a physician (n = 1, 6%), and the condition of the infant (n = 1, 6%). Three mothers (17%) wanted to complete SSC during the operation. The most common reasons were exhaustion as cited by 9 mothers (75%) and pain as cited by 3 mothers (25%). One mother stopped early SSC because a midwife noticed that her baby had grunting and tachypnea 5 min after starting the early SSC. The baby was then moved to an infant warmer and given oxygen, which improved the baby's respiratory condition.

3.2. Observations during implementation of early SSC after CS

All the mothers smiled and touched their baby when their baby was placed on their chest. One mother looked stiff and appeared to be afraid to touch her baby. When her baby cried, she looked at her baby and gently stroked her baby's back saying, "there, there". Another mother who felt sick because of the side effects of anesthesia could still smile and kissed her baby saying, "my sweet baby".

Table 2

Demographics of participants and duration of skin-to-skin contact (SSC) (N = 17).

		n	%
Age (years)	Mean (Range)	31	(22–39)
	20–29	6	35
	30–34	6	35
	≥35	5	30
Education	Degree	5	29
	Diploma	9	53
	Secondary	3	18
Infant's weight (gm)	Mean (Range)	3393	(2890–4410)
	2500–2999	1	5
	3000–3499	8	47
	3500–3999	4	24
	≥4000	4	24
Duration of SSC	<10 min	4	23
	10–19 min	7	41
	20–29 min	3	18
	≥30 min	3	18

3.3. Comprehension of information program for pregnant women (mothers scheduled for repeat CS)

To ascertain the mothers' comprehension of the information program, we asked them if they have heard of any information about the SSC from the midwives. All of the 17 mothers (100%) answered that they "Clearly heard", "Heard" or "Barely heard" the following information from the midwives: *SSC is the placement of a naked infant on the mother's bare skin; The baby rests on the mother's chest immediately after the baby is born; SSC is suggested to start immediately after birth and continue for at least 1 hour; The baby can get immunity from the mother during SSC; The baby who received early SSC maintained cardio-respiratory stability compared with the baby who did not receive early SSC; Early SSC strengthens the bonding between the mother and the baby; Early SSC promotes exclusive breastfeeding.* There were 6 mothers (35%) who answered "Completely did not hear" of the following from the midwives: *The observation points for the baby are hypothermia, abnormal breathing, and cyanosis (Fig. 1).* These terms were explained in simple language to the women.

3.4. Perceptions of SCC advantages

The SSC advantages to which all of the 17 mothers (100%) answered "Totally agree", "Agree" or "Quite agree" were as follows: *The mother can touch her baby immediately after birth; The mother can feel comfortable; The mother and baby can strengthen their bonding; The baby cries less; The baby has less hypothermia.* Three mothers (18%) answered that they "Disagree" that *The mother can feel less pain (Fig. 2).*

3.5. Interviews after delivery

3.5.1. Differences between previous deliveries and present deliveries

Regarding their previous deliveries without *early SSC after CS*, 7 mothers (41%) answered "Very satisfied" and 4 mothers (24%) answered "Satisfied" (N = 11); 1 mother (6%) answered "Dissatisfied" and 5 mothers (29%) answered "Very dissatisfied". Regarding their present deliveries with *early SSC after CS*, 15 mothers (88%) answered "Very satisfied" and 2 mothers (12%) answered "Satisfied" (Fig. 3).

Eight mothers (47%) indicated that they felt less pain during the *early SSC after CS*, and 4 mothers (24%) felt that they could recover faster than with their previous deliveries. A mother said "I felt good even when they were stitching, I did not feel much pain because my baby was on my chest".

Four mothers (24%) reported that they became more aware of their babies by touching their babies and feeling their babies' heartbeat and temperature, making them realize that their babies were truly alive. One of the mothers said, "We [my baby and I] developed a closer relationship", and "I showed her love".

In the opinion of the minority, 1 mother noticed a change in her baby's appearance. She said "I felt that she discovered that I am her mother because she stayed very relaxed when she was placed on me so she felt that I was her mother and so she lied very calmly". Another mother felt a better birth experience and said, "There is improvement with this skin-to-skin contact".

3.5.2. Differences between information program for pregnant women and implementation of early SSC after CS

Fifteen mothers (88%) evaluated the *information program for pregnant women* as very useful (10 points), and 2 mothers (12%) evaluated the *information program for pregnant women* as useful (8 points). The average was 9.7 points.

Seven mothers (41%) answered "Completely different" or "Different" when comparing the *information program for pregnant women* with the implementation of *early SSC after CS*. Six mothers (35%) reported that they felt real pleasure and less pain during *early SSC after CS*, which they could not imagine with the *information program for pregnant women*. Some mothers said "At the beginning, I thought it was impossible but after they brought my baby to me I said, 'Oh so it is a possible thing'", and "When I heard about it, I was not aware of its importance until I did it. That is when I understood that it is very important". However, four mothers (24%) found no difference between the *information program for pregnant women* and the implementation of *early SSC after CS*.

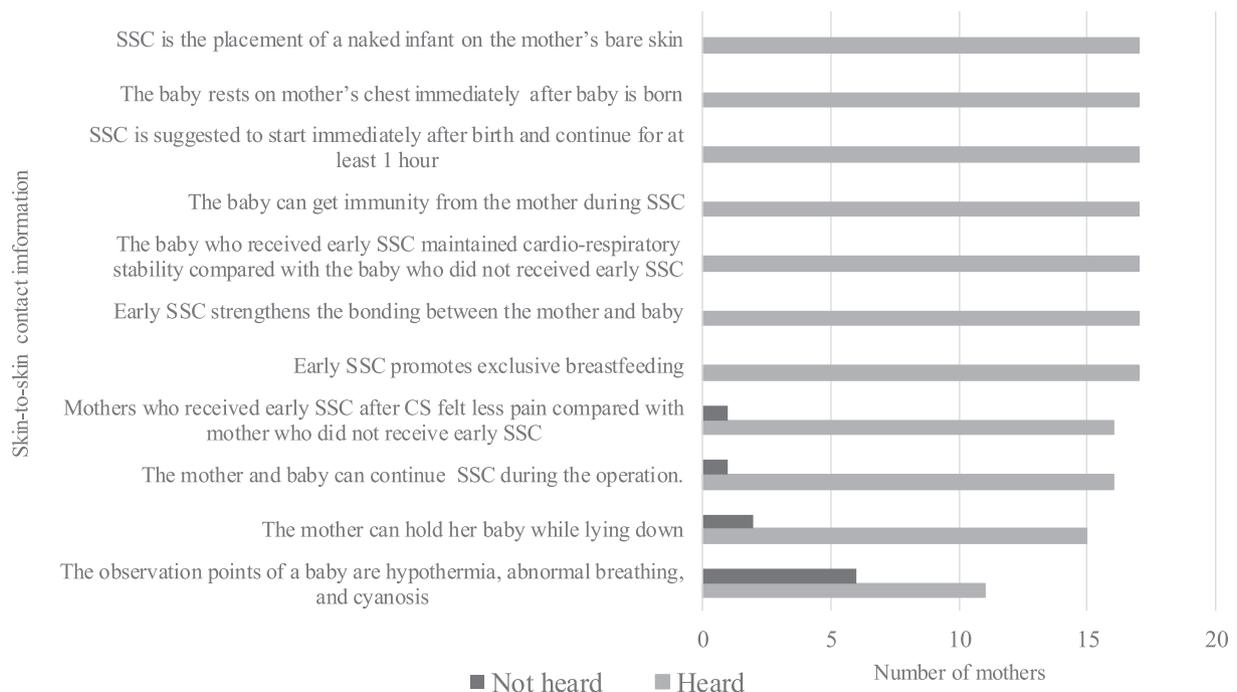


Fig. 1. Comprehension of the skin-to-skin contact (SSC) information program for pregnant women (mothers scheduled for repeat cesarean section (CS)). Note. Not heard included "Not heard" and "Completely did not hear". Heard included "Clearly heard", "Heard", and "Barely heard".

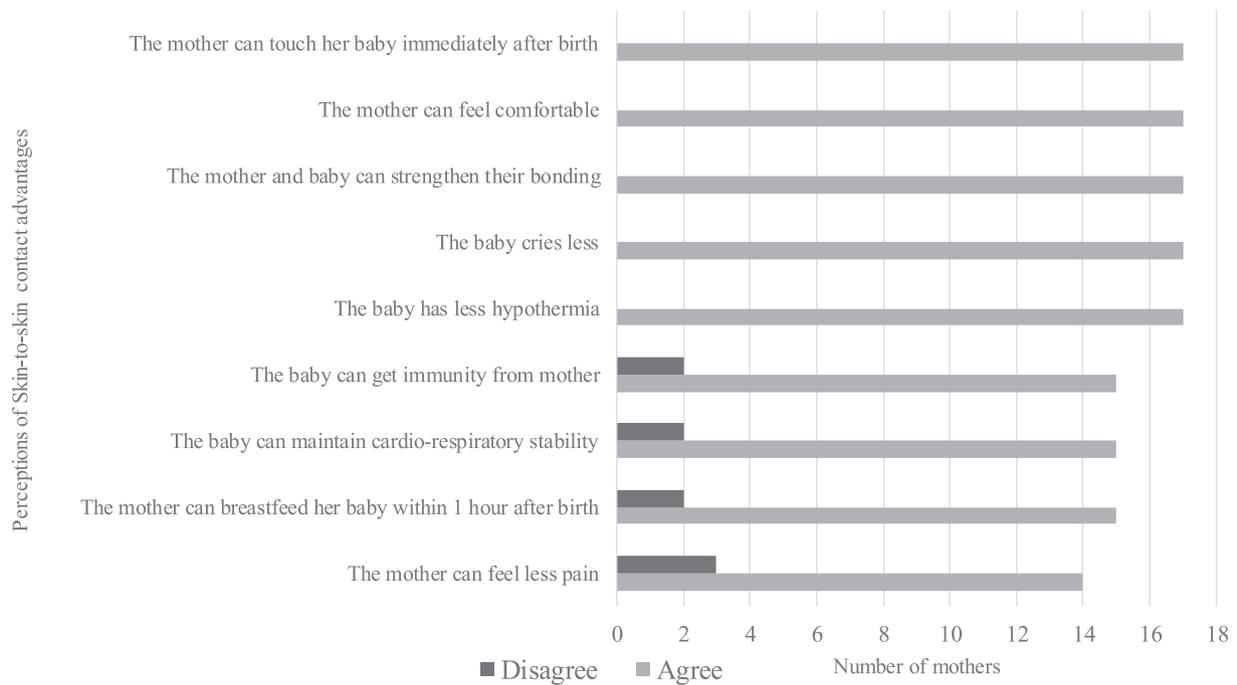


Fig. 2. Perceptions of the advantages of SSC. Note. Agree included “Totally agree”, “Agree” and “Quite agree”. Disagree included “Disagree” and “Totally disagree”.

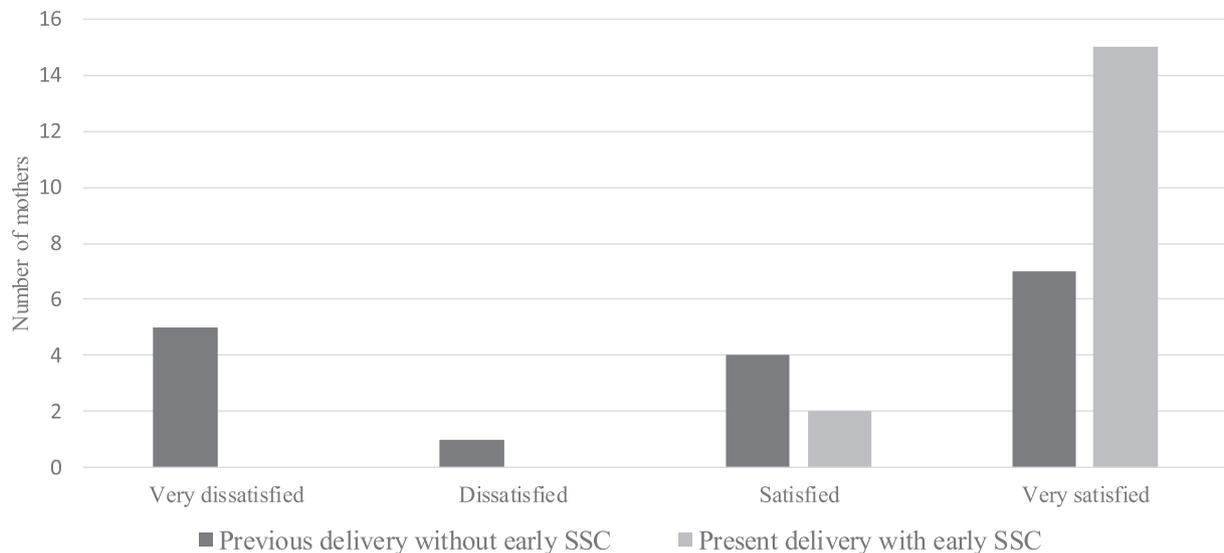


Fig. 3. Comparison of satisfaction levels between previous delivery and present delivery (N = 17).

3.6. Requests for the future

Some mothers expressed their desire to extend the times and places of *early SSC after CS* such as in the following situations: “When they wanted to take my baby away I wanted her to remain with me”, and “When I came out of the obstetric theater and went to the recovery room, it would have been good if I was given my baby while I stayed in the recovery room”. In addition, 1 mother said, “I would recommend SSC to all women who plan to undergo CS to reduce their pain”.

4. Discussion

4.1. Summary

This study set out to develop and implement an *early SSC after CS*

protocol and to describe mothers’ perceptions of *early SSC after CS*. Interviews were conducted with the mothers who underwent CS with *early SSC*.

In this study, the practicality of the *early SSC after CS* protocol has been demonstrated by conducting a two-step educational program. The first step consisted of a *training program for the medical staff* which involved not only midwives but also doctors and the anesthesiology staff. The second step consisted of an *information program for the pregnant women* which was provided to the mothers (scheduled for repeat CS) who participated in this study. The majority of mothers felt that their present delivery with *early SSC after CS* was satisfactory. They expressed their hope for an expansion of the time and place of *early SSC after CS*. These findings concur with those of previous studies (Armbrust et al., 2016; Sundin & Mazac, 2015).

4.2. Program assessment: Implementation, Practicality, acceptability

4.2.1. Implementation

The dropout rate in this study was 35% (n = 9). Two (12%) dropped out because of family opposition. This suggests the necessity of providing information to the family before participation. Three (18%) dropped out because of the poor respiratory condition of their newborn babies. The midwife who worked at the obstetric theater made the judgment regarding the baby's respiratory condition. This indicates that in certain cases, *early SSC after CS* cannot be performed unless the health of the mothers and infants is favorable. Four women (24%) were excluded as it was not possible to follow them because they had an emergency CS. During the scheduled CS, the SSC promotion team members took the initiative to implement the SSC. Thus, *early SSC after CS* was carried out smoothly in the 17 participants. However, when the team members were absent, the other midwives were not confident in their ability to introduce SSC, and the implementation of *early SSC after CS* in the four women who had emergency CS also proved to be difficult. All the newborns were safely delivered by CS and were healthy to receive SSC. This implies the necessity to train every midwife so that each midwife can implement *early SSC after CS*. Although the dropout rate was higher than anticipated, future improvements can be achieved by enhancing the education of both the pregnant women and their family members and the care providers.

4.2.2. Practicality

One of the midwives who took care of babies played a central role in implementing the SSC. The introduction of *early SSC after CS* involved not only midwives but also obstetric physicians and the anesthesiology staff. Indeed, the implementation of *early SSC after CS* has many advantages. However, its introduction has also some difficulties. [Zakarija-Grković and Burmaz \(2010\)](#) reported that after the implementation of the UNICEF/WHO 20-hour course to optimally improve knowledge, behavior, and attitudes towards breastfeeding, improvements for the appropriate recommendations of SSC after CS were minimal. To achieve such improvements, a change in the overall policy is needed in addition to individual training. In line with this approach and realizing the limited part that could be carried out only by midwives in the present study, a training program was given in advance to obstetric physicians and the anesthesiology staff. This made it possible to implement *early SSC after CS* as a policy of the whole organization. As an important element to unify the overall policy, an information program was given to the pregnant women who were scheduled for repeat CS and *early SSC after CS*.

The WHO has recommended that all women engage in early SSC for at least one hour or until the start of the first breastfeeding ([World Health Organization, 2017](#)). In the present study, the duration of *early SSC after CS* was approximately 10–19 min. After experiencing *early SSC after CS*, the participants expressed their desire for a longer implementation.

Regarding the responses to pain and discomfort, close cooperation with the obstetric physicians and anesthesiology staff will be required to realize an optimal pain management approach in the future. To reduce fatigue, it will be necessary to consider measures to allocate personnel to help mothers hold their babies. During the SSC, one baby had a poor respiratory condition and the mother showed a proper response by calling attention to this situation, preventing an adverse event from occurring. Newborn babies are prone to changes in their condition. Therefore, the medical staff need to be prepared for the early detection and management of abnormalities. The training program for the medical staff on the observation points of the mother and baby during *early SSC after CS* and their education on neonatal resuscitation showed promise in effectively preventing an adverse event.

4.2.3. Acceptability

Although there were suggestions for improvements in the SSC

method and its duration, there were no negative remarks from the mothers about the actual implementation of *early SSC after CS*. Moreover, almost all the mothers expressed increased satisfaction when they compared their present delivery with *early SSC after CS* with their previous delivery without *early SSC after CS*. The present results are in accordance with those of [Sundin and Marzac \(2015\)](#) in the USA and [Armbrust et al. \(2016\)](#) in Germany. It was suggested that *early SSC after CS* might increase the satisfaction level of delivery regardless of the study location. In the present interviews, one participant expressed that all mothers who undergo CS should be able to receive early SSC. It is thought that early SSC education conducted in advance at the antenatal clinic had a positive effect on preparing the mothers. The subsequent study will require a larger sample size, expansion of scope, and verification of the effects of SSC after CS for better generalization.

Although some mothers felt a difference between the *information program for pregnant mothers* and the implementation of *early SSC after CS*, almost all the mothers indicated that the information program was useful. They felt positive changes that they could not have imagined when they received *early SSC after CS*.

In terms of teaching logistics, [Fujita et al. \(2017\)](#) indicated that many pregnant women in Tanzania prefer images as teaching materials rather than textual teaching materials and verbal explanations. When videos cannot be used because of logistical problems, teaching methods using storyboards and personal testimonies from mothers who have experienced SSC after CS or role-plays of SSC after CS should be considered. These methods are anticipated to assist mothers in gaining a better understanding of SSC after CS.

5. Limitations

The present study was limited to 17 participants recruited from a single hospital, which may elicit a concern regarding the study's generalizability. As the focal aim of this study was to describe the mothers' perceptions of *early SSC after CS*, its generalizability was not the primary consideration at this stage. Only the mothers giving birth at MNH who received *early SSC after CS* were asked about how they felt regarding the SSC. These mothers may have provided only good remarks about the *early SSC after CS* for social desirability. The *training program for the medical staff* was realizable short, which resulted in their limited ability to carry out *early SSC after CS* following an emergency CS. To this end, if the conditions of the mother and baby are good, an *early SSC after CS* protocol must be developed to support non-repeat CS and emergency CS. More practical training programs for the medical staff would also be helpful. For future research, it is necessary to clarify the perception of the medical staff regarding the acceptability of SSC and consider appropriate strategies.

Although our Tanzanian research assistant was proficient with both Swahili and English and translated the interview data, there was a possibility that some data were not translated with the proper meaning in a cross-cultural setting or that important nuances were missed. Ongoing training in a cultural-based approach would be helpful.

Parts of the scale which indicated comprehension of the *information program for pregnant women* and perceptions of the advantages of SSC were developed specifically for this study. Further confirmation of the scale's reliability and validity would be helpful.

6. Conclusions

This study showed that the development of an *early SSC after CS* protocol using a two-step educational program (i.e., *training program for medical staff* and *information program for pregnant women*), and the implementation of this protocol in an operating theater were feasible and facilitated understanding of the participants' perceptions of SSC after CS. All the mothers reported the same or higher levels of satisfactions with their present delivery with *early SSC after CS* than with their previous delivery without *early SSC after CS*. The majority of the mothers

reported that the *information program for the pregnant women* was useful.

In this study, the action research approach facilitated the development of the training program for the midwives, obstetricians, and anesthesiology staff. Moreover, the information program for the pregnant women (mothers scheduled for repeat CS) and the *early SSC after CS* were readily implemented. Also, the adherence criteria were observed and the infants were properly handled, averting any adverse events. Taken together, the developed *early SSC after CS* protocol may be a promising program for implementing *early SSC after CS*. The next steps to take in future studies are to clarify the barriers and challenges of the medical staff and to expand SSC to all mothers who undergo CS regardless of whether it is elective or emergency.

7. Authors' contributions

YI designed the study, conducted the educational program, observed the program implementation, and collected and analyzed the data. SH supervised the whole process of the study. RF provided advice regarding ethical approval and details of the educational program. BM arranged the local research setting and made important suggestions and logistical preparation/coordination. YI drafted the manuscript and SH made critical reviews and important revisions.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Acknowledgments

We appreciate all the study participants as well as all the medical staff of the maternity operation theater and antenatal clinic at Muhimbili National Hospital in Tanzania.

We also appreciate Dr. Edward Barroga (<http://orcid.org/0000-0002-8920-2607>), Medical and Nursing Science Editor and Professor of Academic Writing at St. Luke's International University, Tokyo, Japan for his guidance in writing the article.

References

- Armbrust, R., Hinkson, L., von Weizacker, K., & Henrich, W. (2016). The Charite cesarean birth: A family orientated approach of cesarean section. *Journal of Maternal-Fetal & Neonatal Medicine*, 29(1), 163–168.
- Bowen, D. J., Kreuter, M., Spring, B., Cofta-Woerpel, L., Linnan, L., Weiner, D., et al. (2009). How we design feasibility studies. *American Journal of Preventive Medicine*, 36(5), 452–457.
- Brady, K., Bulpitt, D., & Chiarelli, C. (2014). An interprofessional quality improvement project to implement maternal/infant skin-to-skin contact during cesarean delivery. *Journal of Obstetric, Gynecologic & Neonatal Nursing*, 43(4), 488–496.
- Bryman, A., & Bell, E. (2011). *Business research methods* (3rd ed.). Oxford University Press: Oxford, United Kingdom.
- Cavallaro, F. L., Pembe, A. B., Campbell, O., Hanson, C., Tripathi, V., Wong, K. LM., et al. (2018). Caesarean section provision and readiness in Tanzania: Analysis of cross-sectional surveys of women and health facilities over time. *BMJ Open Obstetrics and Gynecology*, 8(9), e024216. <https://doi.org/10.1136/bmjopen-2018-024216.1136/bmjopen-2018-024216.suppl>.
- Creswell, J. W., & Clark, V. L. P. (2011). *Designing and Conducting Mixed Methods Research* (2nd Edition). SAGE.
- Fujita, W., Leshabari, S., Mlay, E. D., & Ohashi, K. (2017). Tanzanian women's coping and understanding of labour: A qualitative study at the Amtulabhai Antenatal Clinic. *International Journal of Africa Nursing Sciences*, 7, 4–10.
- Global Partnership for Sustainable Development Data. (2016). Tanzania National Bureau of Statistics. Available at <https://www.nbs.go.tz/> (Accessed on July 15, 2018).
- Graft-Johnson, J. D., Vesel, L., Rosen, H. E., Rawlins, B., Abwao, S., Mazia, G., et al. (2017). Cross-sectional observational assessment of quality of newborn care immediately after birth in health facilities across six sub-Saharan African countries: *BMJ Open*, 7, e014680.
- Hung, K., & Berg, O. (2011). Early skin-to-skin contact after cesarean to improve breastfeeding. *American Journal of Maternal Child Nursing*, 36, 318–326.
- Karlström, A., Lindgren, H., & Hildingsson, I. (2013). Maternal and infant outcome after caesarean section without recorded medical indication: Findings from a Swedish case-control study. *BJOG: An International Journal of Obstetrics & Gynecology*, 120(4), 479–486.
- Kollmann, M., Aldrian, L., Scheuchenecker, A., Mautner, E., Herzog, S. A., Urlesberger, B., et al. (2017). Early skin-to-skin contact after cesarean section: A randomized clinical pilot study. *PLoS ONE*, 12(2), Article e0168783.
- Koopman, L., Callaghan-Koru, J. A., Alaofin, O., Argani, C. H., & Farzin, A. (2016). Early skin-to-skin contact for healthy full-term infants after vaginal and caesarean delivery: A qualitative study on clinician perspectives. *Journal of Clinical Nursing*, 25(9-10), 1367–1376.
- Leyna, G. H., Berkman, L. F., Njelekela, M. A., Kazonda-Kahem, P., Wafaie, I., & Killewo, F. J. (2017). Profile: The Dar es Salaam Health and Demographic Surveillance System (Dar es Salaam HDSS). *International Journal of Epidemiology*, 46(3), 801–808.
- Ministry of Health, Community Development, Gender, Elderly and Children (MoHCDGEC) [Tanzania Mainland], Ministry of Health (MoH) [Zanzibar], National Bureau of Statistics (NBS), Office of the Chief Government Statistician (OCGS), and ICF. (2016). Tanzania Demographic and Health Survey and Malaria Indicator Survey (TDHS-MIS) 2015-16. Dar es Salaam, Tanzania, and Rockville, Maryland, USA: MoHCDGEC, MoH, NBS, OCGS, and ICF. Available at <https://dhsprogram.com/pubs/pdf/FR321/FR321.pdf> (Accessed on June 1, 2020).
- Moore, E. R., Bergman, N., Anderson, G. C., & Dowswell, T. (2016). Early skin-to-skin contact for mothers and their healthy newborn infants. *Cochrane Database Systematic Reviews*, <http://cochranelibrary-wiley.com/doi/10.1002/14651858.CD003519.pub4/full>.
- Moser, A., & Korstjens, I. (2018). Series: Practical guidance to qualitative research. Part 3: Sampling, data collection and analysis. *European Journal of General Practice*, 24(1), 9–18. <https://doi.org/10.1080/13814788.2017.1375091>.
- National Implementation research network. What Are Implementation Stages. Retrieved Available at <https://nirn.fpg.unc.edu/module-4/topic-1-implementation-stages-overview/what-are-stages> (Accessed June 1, 2020).
- Sundin, C. S., & Mazac, L. B. (2015). Implementing skin-to-skin care in the operating room after cesarean birth. *The American Journal of Maternal/Child Nursing*, 40(4), 249–255.
- World Health Organization (2012). Recommendations for management of common childhood conditions. Geneva. Available at https://www.who.int/maternal_child_adolescent/documents/management_childhood_conditions/en/ (Accessed May, 15, 2020).
- World Health Organization (2015). WHO statement on caesarean section rates. Geneva. Available at https://apps.who.int/iris/bitstream/handle/10665/161442/WHO_RHR_15.02_eng.pdf?sequence=1 (Accessed May, 2, 2020).
- World Health Organization. (2017). *Guideline: Protecting, promoting and supporting breastfeeding in facilities providing maternity and newborn services* (pp. 9–11). Geneva: License: CC.
- World Health Organization. (2018). *WHO recommendations Intrapartum care for a positive childbirth experience*. Geneva: License: CC.
- Zakarija-Grković, I., & Burmaz, T. (2010). Effectiveness of the UNICEF/WHO 20-hour course in improving health professionals' knowledge, practices, and attitudes to breastfeeding: A before/after study of 5 maternity facilities in Croatia. *Croatian Medical Journal*, 51(5), 396–405.